SPEC ACCEL™ ACC Result

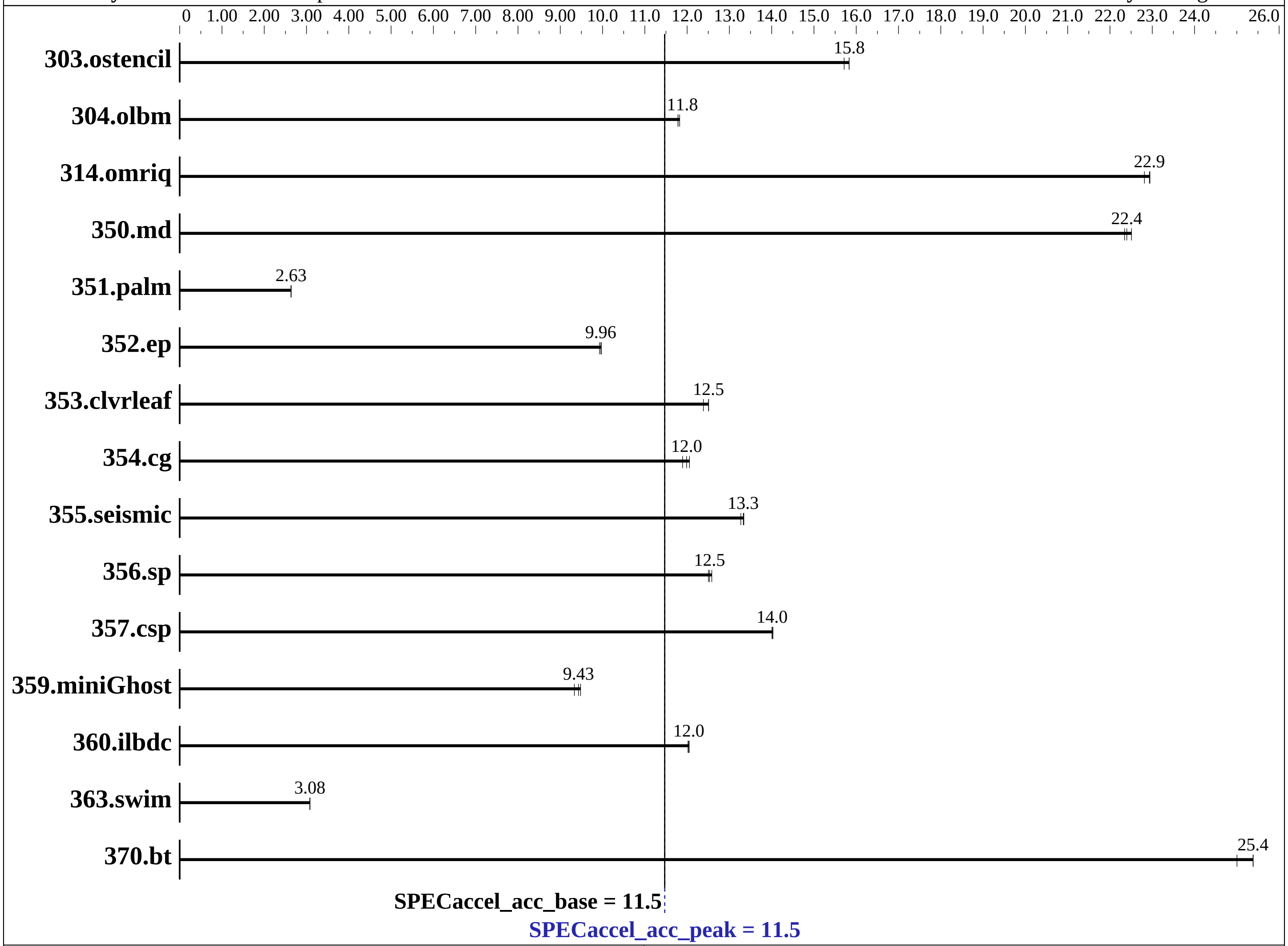
Supermicro
(Test Sponsor: NVIDIA Corporation)

Tesla V100-PCIE-16GB SuperServer 1029GQ-TRT

SPECaccel_acc_peak = 11.5

SPECaccel_acc_base = 11.5

ACCEL license:	019	**Test date:**	Jul-2018
Test sponsor:	NVIDIA Corporation	**Hardware Availability:**	Nov-2017
Tested by:	NVIDIA Corporation	**Software Availability:**	Aug-2018



Hardware

CPU Name:	Intel Xeon Gold 6148
CPU Characteristics:	
CPU MHz:	2400
CPU MHz Maximum:	3700
FPU:	Integrated
CPU(s) enabled:	40 cores, 2 chips, 20 cores/chip, 2 threads/core
CPU(s) orderable:	1,2 chips
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	1 MB I+D on chip per core
L3 Cache:	28160 KB I+D on chip per chip
Other Cache:	None

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Accelerator

Accel Model Name:	Tesla V100
Accel Vendor:	NVIDIA Corporation
Accel Name:	Tesla V100-PCIE-16GB
Type of Accel:	GPU
Accel Connection:	PCIe
Does Accel Use ECC:	Yes
Accel Description:	See notes
Accel Driver:	NVIDIA UNIX x86_64 Kernel Module 390.46

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Hardware (Continued)

Memory: 384 GB (12 x 32 GB 2Rx8 PC4-2666V-R)
Disk Subsystem: 512GB Samsung 960 PRO M.2 PCIe 3.0 x4 NVMe Solid State Drive
Other Hardware: None

Software

Operating System: CentOS Linux release 7.4.1708 (Core) 3.10.0-693.17.1.el7.x86_64
Compiler: PGI Professional Edition, Release 18.7 LLVM
File System: xfs
System State: Run level 3 (multi-user)
Other Software: None

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
303.ostencil	9.23	15.7	9.16	15.8	**9.16**	**15.8**	9.23	15.7	9.16	15.8	**9.16**	**15.8**
304.olbm	38.6	11.8	**38.6**	**11.8**	38.5	11.8	38.6	11.8	**38.6**	**11.8**	38.5	11.8
314.omriq	**41.7**	**22.9**	41.7	22.9	41.9	22.8	**41.7**	**22.9**	41.7	22.9	41.9	22.8
350.md	**11.3**	**22.4**	11.2	22.5	11.3	22.3	**11.3**	**22.4**	11.2	22.5	11.3	22.3
351.palm	141	2.63	**141**	**2.63**	140	2.64	141	2.63	**141**	**2.63**	140	2.64
352.ep	**53.2**	**9.96**	53.4	9.93	53.2	9.97	**53.2**	**9.96**	53.4	9.93	53.2	9.97
353.clvrleaf	35.6	12.5	35.9	12.4	**35.6**	**12.5**	35.6	12.5	35.9	12.4	**35.6**	**12.5**
354.cg	34.3	11.9	**34.0**	**12.0**	33.8	12.1	34.3	11.9	**34.0**	**12.0**	33.8	12.1
355.seismic	27.9	13.3	27.7	13.3	**27.8**	**13.3**	27.9	13.3	27.7	13.3	**27.8**	**13.3**
356.sp	**22.0**	**12.5**	22.1	12.5	21.9	12.6	**22.0**	**12.5**	22.1	12.5	21.9	12.6
357.csp	**19.3**	**14.0**	19.2	14.0	19.3	14.0	**19.3**	**14.0**	19.2	14.0	19.3	14.0
359.miniGhost	**39.1**	**9.43**	38.9	9.48	39.5	9.33	**39.1**	**9.43**	38.9	9.48	39.5	9.33
360.ilbdc	**30.5**	**12.0**	30.5	12.0	30.5	12.0	**30.5**	**12.0**	30.5	12.0	30.5	12.0
363.swim	74.6	3.08	**74.7**	**3.08**	74.8	3.08	74.6	3.08	**74.7**	**3.08**	74.8	3.08
370.bt	8.92	25.0	**8.79**	**25.4**	8.78	25.4	8.92	25.0	**8.79**	**25.4**	8.78	25.4

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Submit Notes

```
The config file option 'submit' was used.
Submit command: numactl -C 1 -m 0 $command
```

Operating System Notes

```
Stacksize set to 'unlimited'
```

Platform Notes

```
Sysinfo program /local/home/aglobus/spec-accel/Docs/sysinfo
$Rev: 6965 $ $Date:: 2015-04-21 #$ c05a7f14b1b1765e3fe1df68447e8a35
running on perf-sky2.pgi.net Wed Jul 25 20:12:07 2018

This section contains SUT (System Under Test) info as seen by
some common utilities.  To remove or add to this section, see:
  http://www.spec.org/accel/Docs/config.html#sysinfo

From /proc/cpuinfo
   model name : Intel(R) Xeon(R) Gold 6148 CPU @ 2.40GHz
      2 "physical id"s (chips)
      80 "processors"
   cores, siblings (Caution: counting these is hw and system dependent.  The
   following excerpts from /proc/cpuinfo might not be reliable.  Use with
   caution.)
      cpu cores : 20
      siblings  : 40
      physical 0: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
      physical 1: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
   cache size : 28160 KB

From /proc/meminfo
   MemTotal:       394873648 kB
   HugePages_Total:      20
   Hugepagesize:       2048 kB

/usr/bin/lsb_release -d
   CentOS Linux release 7.4.1708 (Core)

From /etc/*release* /etc/*version*
   centos-release: CentOS Linux release 7.4.1708 (Core)
   centos-release-upstream: Derived from Red Hat Enterprise Linux 7.4 (Source)
   os-release:
      NAME="CentOS Linux"
      VERSION="7 (Core)"
      ID="centos"
      ID_LIKE="rhel fedora"
      VERSION_ID="7"
      PRETTY_NAME="CentOS Linux 7 (Core)"
      ANSI_COLOR="0;31"
      CPE_NAME="cpe:/o:centos:centos:7"
   redhat-release: CentOS Linux release 7.4.1708 (Core)
   system-release: CentOS Linux release 7.4.1708 (Core)
   system-release-cpe: cpe:/o:centos:centos:7
```

Continued on next page

Platform Notes (Continued)

```
uname -a:
   Linux perf-sky2.pgi.net 3.10.0-693.17.1.el7.x86_64 #1 SMP Thu Jan 25 20:13:58
   UTC 2018 x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Mar 29 15:36

SPEC is set to: /local/home/aglobus/spec-accel
   Filesystem                     Type  Size  Used Avail Use% Mounted on
   /dev/mapper/centos_sky2-root xfs   472G   60G  413G  13% /
Additional information from dmidecode:

   Warning: Use caution when you interpret this section. The 'dmidecode' program
   reads system data which is "intended to allow hardware to be accurately
   determined", but the intent may not be met, as there are frequent changes to
   hardware, firmware, and the "DMTF SMBIOS" standard.


(End of data from sysinfo program)
Information from pgaccelinfo
CUDA Driver Version:           9010
NVRM version:                  NVIDIA UNIX x86_64 Kernel Module  390.46
Device Number:                 0
Device Name:                   Tesla V100-PCIE-16GB
Device Revision Number:        7.0
Global Memory Size:            16945512448
Number of Multiprocessors:     80
Concurrent Copy and Execution: Yes
Total Constant Memory:         65536
Total Shared Memory per Block: 49152
Registers per Block:           65536
Warp Size:                     32
Maximum Threads per Block:     1024
Maximum Block Dimensions:      1024, 1024, 64
Maximum Grid Dimensions:       2147483647 x 65535 x 65535
Maximum Memory Pitch:          2147483647B
Texture Alignment:             512B
Clock Rate:                    1380 MHz
Execution Timeout:             No
Integrated Device:             No
Can Map Host Memory:           Yes
Compute Mode:                  default
Concurrent Kernels:            Yes
ECC Enabled:                   Yes
Memory Clock Rate:             877 MHz
Memory Bus Width:              4096 bits
L2 Cache Size:                 6291456 bytes
Max Threads Per SMP:           2048
Async Engines:                 7
```


Continued on next page

Platform Notes (Continued)

```
Unified Addressing:               Yes
Managed Memory:                   Yes
Concurrent Managed Memory:        Yes
Preemption Supported:             Yes
Cooperative Launch:               Yes
  Multi-Device:                   Yes
PGI Default Target:               -ta=tesla:cc70
```

General Notes

```
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown)
is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1)
is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2)
is mitigated in the system as tested and documented.
```

Base Compiler Invocation

C benchmarks:
`pgcc`

Fortran benchmarks:
`pgfortran`

Benchmarks using both Fortran and C:
`pgcc pgfortran`

Base Optimization Flags

C benchmarks:
`-Mllvm -V18.7 -fast -Mfprelaxed -Mnouniform -acc -ta=tesla:cc70`

Fortran benchmarks:
`-Mllvm -V18.7 -fast -Mfprelaxed -Mnouniform -acc -ta=tesla:cc70`

Benchmarks using both Fortran and C:

353.clvrleaf: `-Mllvm -V18.7 -fast -Mfprelaxed -Mnouniform -acc -ta=tesla:cc70`

359.miniGhost: `-Mllvm -V18.7 -fast -Mfprelaxed -Mnouniform -acc -ta=tesla:cc70 -Mnomain`

Peak Optimization Flags

C benchmarks:

303.ostencil: `basepeak = yes`

304.olbm: `basepeak = yes`

314.omriq: `basepeak = yes`

352.ep: `basepeak = yes`

354.cg: `basepeak = yes`

357.csp: `basepeak = yes`

370.bt: `basepeak = yes`

Fortran benchmarks:

350.md: `basepeak = yes`

351.palm: `basepeak = yes`

355.seismic: `basepeak = yes`

356.sp: `basepeak = yes`

360.ilbdc: `basepeak = yes`

363.swim: `basepeak = yes`

Benchmarks using both Fortran and C:

353.clvrleaf: `basepeak = yes`

359.miniGhost: `basepeak = yes`

The flags files that were used to format this result can be browsed at
https://www.spec.org/accel/flags/PGI-Platform-Multicore-OMP.html
https://www.spec.org/accel/flags/pgi2018_flags.html

You can also download the XML flags sources by saving the following links:
https://www.spec.org/accel/flags/PGI-Platform-Multicore-OMP.xml
https://www.spec.org/accel/flags/pgi2018_flags.xml

For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

Tested with SPEC ACCEL v1.2.
Report generated on Thu Aug 30 18:55:40 2018 by SPEC ACCEL PS/PDF formatter v1290.
Originally published on 30 August 2018.